SOV/115-59-10-23/29

About The Organization and Activities of Testing Laboratories in Plants

task of the technical section and of the technological staff of the plants. The development of new equipment is also primarily the task of these sections and the laboratories can only help in the fulfillment of this task in which case, however, the laboratory staff must be increased. The author also finds, that a division of plant laboratories into 3 categories could greatly improve the quality of laboratory work. Those placed in the lowest categories will strive to improve their work to a degree which will permit their transfer into the next, superior category. The lack of incentives usually results in the lack of interest for technical progress. The author further describes the measures taken by the Upravleniye mashinostroitel'noy i khimicheskoy promyshlennosti Ivanovskogo sovnarkhoza (Directorate of the Machine Building and Chemical Industry of the Ivanovo Sovnarkhoz) to improve and clearly define the duties of the measuring laboratory. In the

Card 2/3

SUVOROV, A.I.

Checking taximeters. Izm.tekh. no.5:13-14 My '61. (MIRA 14:5)

(Taxicabs—Testing)

SUVOROV, A.I.

Measures of hardness.   Izm.tekh. no.9:19-20 S '61.
(MIRA 14:8)

(Hardness—Measurement)

SUVOROV, A.I.

Determining the measuring power of micrometer devices.   Izm.tekh.
no.4:8-9 Ap '62.   (MIRA 15:4)

(Micrometer)

SUVOROV, A.I., SHATSKIY, N.S., akademik, glavny redaktor; PEYVE, A.V., otvetstvennyy redaktor; LADYCHUK, L.P., redaktor; POLYAKOVA, T.V., tekhnicheskiy redaktor.

Tectonic division of the Fergana Basin into districts on the basis of genetic characteristics. Trudy Inst. geol. nauk no. 158:3-91 '54.

(MIRA 8:2)

(Fergana--Geology, Structural)

Suvorov A.I.

USSR/ Geology

Card 1/1   Pub. 46 - 6/21

Authors   : Suvorov, A. I.

Title   : Some signs of subterranean fractures

Periodical   : Izv. AN SSSR, Ser geol. 1, 65-79, Jan-Feb 1955

Abstract   : The article gives a description of fractures of the subterranean Paleozoic
                foundation of some regions in Central Asia on the basis of data on the
                structure of the Mesocenozoic and Paleozoic structural levels in the
                zone of their visible juxtaposition. The ruptures of the Paleozoic
                foundation are exposed in Mesocenozoic deposits in the form of different
                deformations, both ruptured and folded. The latter may therefore, be
                considered in a way as surface indications of fractures. Ten Soviet
                references: (1935-1954). Maps.

Institution : .....

Submitted   : March 29, 1954

SUVOROV, A.I.

Tectonics of the Angren Valley. Izv.AN SSSR.Ser.geol.21 no.10:13-22 O '56.   (MIRA 10:1)

1. Geologicheskiy institut Akademii nauk SSSR, Moskva.
    (Angren Valley--Geology, Structural)

SOV/11-59-4-5/16

3 (5)

AUTHOR: Suvorov, A. I.

TITLE: Meso-Cenozoic Folded-Block Structures of the Northern Tien-Shan (O Mezokaynozoyskikh skladchato-glybovykh strukturakh Severnogo Tyan' - Shanya).

ABSTRACT: As a result of a detailed study of the structure of the Northern Tien-Shan, the whole region is considered as a specific folded-block geosynclinal province. Its formation began in the Upper-Paleozoic era and continued all through the Meso-Cenozoic eras. The folded-block structures of the Northern Tien-Shan are divided in a series of morphologic varieties and form zones of graphic texture and development. These zones originated as a result of differentiated contrast moves of separated parts of the earth's crust, and their morphologic appearance was in each separate case determined by the hypsometric level of formation of structures, by the lithologic features of deformed strata

Card 1/2

SUVOROV, A.I.

Definitions and terminology of fold-block structures.   Biul.MOIP.
Otd.geol. 34 no.4:31-49 Jl-Ag '59.   (MIRA 13:8)
            (Geology, Structural)

SUVOROV, A.I.

Uspenskaya zone of central Kazakhstan and some of its analogues.
Izv. AN SSSR. Ser.geol. 26 no.8:67-82 Ag '61.   (MIRA 14:9)

1. Geologicheskiy institut AN SSSR, Moskva.
                (Kazakhstan--Geology, Structural)

SUVOROV, A.I.

Characteristics of the Aktas fault zone in central Kazakhstan.
Izv.AN SSSR.Ser.geol. 27 no.3:17-29 Mr '61.   (MIRA 15:2)

1. Geologicheskiy institut AN SSSR, Moskva.
            (Aktas Valley--Faults (Geology))

SUVOROV, A.I.

The Uspenskiy-Aktas dynamic fracture pair in central Kazakhstan.
Dokl. AN SSSR 137 no.4:938-941 Ap '61.   (MIRA 14:3)

1. Geologicheskiy institut AN SSSR. Predstavleno akademikom
A. L. Yanshinym.
  (Karaganda Province—Geology, Structural)

SUVOROV, A.I.

Classification of extensive faults in geosynclinal regions, as exemplified by Kazakhstan and Central Asia. Dokl. AN SSSR 147 no.1:191-194 N '62.   (MIRA 15:11)

1. Geologicheskiy institut AN SSSR. Predstavleno akademikom A.L. Yanshinym.
            (Kazakhstan--Faults (Geology))
          (Soviet Central Asia--Faults (Geology))

SUVOROV, A.I.

Spasskaya zone of central Kazakhstan and some problems of shift tectonics. Izv. AN SSSR Ser. geol. 28 no.9:46-60 S '63.
(MIRA 16:10)

1. Geologicheskiy institut AN SSSR, Moskva.

SUVOROV, A.I.; SAMYGIN, S.G.

Tectonic convergence of facies through powerful thrusts. Izv.
AN SSSR. Ser. geol. 30 no.5:46-64 My '65.

(MIRA 18:6)

1. Geologicheskiy institut AN SSSR, Moskva.

66910
24-28-11-1/5

5.3700 (B)
5 (7)

AUTHORS: Suvorov, A. L.; Spasskiy, S. S.

TITLE: Organic Titanium Compounds

PERIODICAL: Uspekhi khimii, 1959, Vol 28, Nr 11, pp 1267-1309 (USSR)

ABSTRACT: The chemistry of organic titanium compounds has been
                considerably developed in the last 10-15 years. In the present
                paper, an attempt was made to summarize and systematize the
                data available in this field. Substances containing titanium
                with at least 1 organic radical are dealt with more thoroughly.
                All organic titanium compounds may be divided into 3 groups:
                1) Compounds containing titanium-carbon bonds (real organo-
                titanium compounds), including the bis-cyclopentadienyl
                compounds of titanium; 2) compounds in which the organic radical
                is combined with the titanium atom by elements such as oxygen,
                nitrogen et al (esters and amides of titanic acids, mixed
                anhydrides of titanic and carboxylic acids etc); and 3)coordination
                compounds of inorganic titanium compounds with organic
                molecules. In the present paper, mainly compounds of the
                largest, the second group, are dealt with, and the 1st group is
                mentioned briefly. Coordination compounds are not discussed.
                Methods of preparation, physical and chemical properties of

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SOV/74-28-11-1/5

Organic Titanium Compounds

each single class of compounds are discussed, and tables containing all known compounds and their constants are presented. According to the authors, the tables give most reliable data. Further, all sources are indicated in which the compounds in question are described and their constants are given, even if the latter are not in agreement with the values in the tables. Compounds described in patents containing no constants have not been enclosed in the tables. Compounds with the Ti-C bond have been thoroughly discussed in the survey made by Cotton (Ref 8) and published in 1955. Further papers in this field are references 9-29. Bis-cyclopentadienyl derivatives of titanium belong to the class of compounds of the ferrozene type (Refs 30-40). The compounds of the $Ti(ER)_n X_{4-n}$ type belong to the derivatives of the ortho-titanic acid; R = organic radical, E = O, N, S; X = halogen, n = 1, 2, 3, 4. Thus, the derivatives of ortho-titanic acid include halogen compounds, orthoester, among them mixed esters with different R, and ethers of polyatomic alcohols; acyl derivatives; amides of ortho-titanic acid, as well as derivatives of ortho-titanic acid, and trialkyl(aryl)-silanes (Refs 41-186). Meta-titanic

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Organic Titanium Compounds.   SOV/74-28-11-1/5

acid esters or dialkoxy-titanium oxides $(RO)_2TiO$ are substances

little known (Refs 113, 123, 154, 187). Esters of the
titanous acid or trialkoxy-titanium compounds $Ti(OR)_3$ are

obtained on reduction of alkyl-ortho-titanium compounds with
metallic sodium (Ref 79) or potassium (Ref 154) in alcohol.
From among polymeric organic titanium compounds, the poly-
titanium oxane compounds are best known which contain an
inorganic chain of titanium and oxygen atoms surrounded by
organic groups. So far, only a few hexaalkoxy-dititanium
oxanes (Refs 187, 188) and octaalkoxy-trititanium oxanes
(Refs 62, 187) have been isolated. Further, polyorganosiloxane-
titanium oxanes are known which are polytitanium oxanes (I),
and the chains of which are surrounded by trialkyl(aryl)-
siloxy groups; and also polyorganotitanium siloxanes (II)
containing an inorganic chain of titanium, silicon and
oxygen atoms surrounded by organic groups. Few data are
available on polymers obtained by polymerization or
copolymerization of some unsaturated organic titanium compounds
(Refs 62, 76, 77, 88, 94, 95, 92, 118-120, 123, 113, 136, 137,
141-143, 151, 169, 171, 187-214). Organic titanium compounds

Card 3/5

Organic Titanium Compounds

66910
SOV/74-28-11-1/5

ASSOCIATION: Ural'skiy filial AN SSSR (Ural Branch AS USSR). Institut
khimii, laboratoriya vysokomolekulyarnykh soyedineniy
(Chemical Institute, Laboratory of High-molecular Compounds)

Card 5/5

On the Characteristics of the α,β-Unsaturated Ketones. VII

SOV/79-29-3-20/61

α,β-unsaturated ketones and prove to be more sensitive to very weak hydrolysis reagents. Besides, the behavior of the β-ketols in the hydrolysis differs from that of the α,β-unsaturated ketones by the fact that a change of the NaOH-concentration exerts a slight influence upon the cleavage intensity of the β-ketols whereas the hydrolytic cleavage of the α,β-unsaturated ketones is considerably influenced. The rate of hydrolysis of the aliphatic aromatic ketones investigated increases significantly when the NaOH concentration is increased from 0.01 to 0.1 n. 8 β-ketols hitherto unknown were synthesized and described. It was determined how far the hydrolytic cleavage of the β-ketols and at the same time that of the α,β-unsaturated ketones develops and it was proved that the latter separate but little HBr on bromination. There are 2 tables and 4 references, 2 of which are Soviet.

ASSOCIATION: Ural'skiy gosudarstvennyy universitet (Ural State University)

SUBMITTED: February 18, 1958

Card 2/2

5(3)

AUTHORS: Suvorov, A. L., Spasskiy, S. S.

TITLE: Copolymerization of Unsaturated Acyl Derivatives of Butyl
            Polytitanate With Styrene

ABSTRACT: Titanium-containing polymers, resulting from polymerization of
             unsaturated titanium-containing compounds or from copolymeriza-
             tion of the latter with vinyl monomers have not yet been
             thoroughly investigated. As may be seen from a short survey of
             publications (Refs 1-4), there are no data available on the
             synthesis and copolymerization of titanium-containing polymers
             type (I)(Scheme) - of which a portion of organic groups is
             unsaturated - with vinyl monomers. The authors attempted to
             explain the possibility of such a synthesis. For this purpose,
             they made use of the case with which the alkoxy groups in acyl
             polytitanates can be replaced by acyl remainders. They obtained
             an unsaturated polycondensation product of type (I). By heating
             an alkyl polytitanate with a fatty acid, preferably one having a
             long chain, the acyl groups were substituted for the alkyl groups
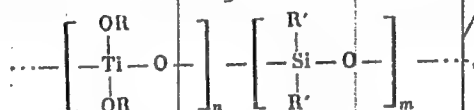
Card 1/2

23767

5.3700   2209

S/190/61/003/006/010/019
B110/B208

AUTHORS: Suvorov, A. L., Spasskiy, S. S.

TITLE: Reaction of butyl orthotitanate with dimethyl diacetoxy sila-
ne

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 3, no. 6, 1961,
865 - 869

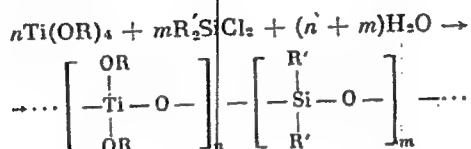TEXT: Polyorganotitanium siloxanes of the formula

$$\cdots - \left[\begin{array}{c} OR \\ | \\ -Ti-O- \\ | \\ OR \end{array} \right]_n - \left[\begin{array}{c} R' \\ | \\ -Si-O- \\ | \\ R' \end{array} \right]_m - \cdots, \qquad A$$

are obtained in the following way by common hydrolysis of the esters
of orthotitanic acid and dialkyl dichlorosilanes according to K. A.
Andrianov (Ref. 1: Soobshcheniye o nauchnykh rabotakh chlenov VKhO im.
Mendeleyeva, 1955, vyp. 3,2; RZhKhim, 1956, 47044):
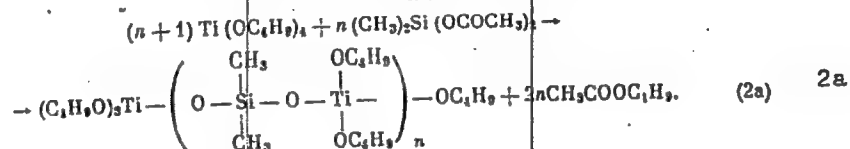
Card 1/8

23767

S/190/61/003/006/010/019
B110/B208

Reaction of butyl ...

$$nTi(OR)_4 + mR_2'SiCl_2 + (n + m)H_2O \rightarrow$$

$$\cdots \left[\begin{array}{c} OR \\ | \\ -Ti-O- \\ | \\ OR \end{array} \right]_n - \left[\begin{array}{c} R' \\ | \\ -Si-O- \\ | \\ R' \end{array} \right]_m - \cdots \qquad (1) \qquad 1$$

The authors tried to synthesize these compounds by heterofunctional condensation of butyl orthotitanate and dimethyl diacetoxy silane according to

$$(n+1)\,Ti\,(OC_4H_9)_4 + n\,(CH_3)_2Si\,(OCOCH_3)_2 \rightarrow$$

$$\rightarrow (C_4H_9O)_3Ti - \left(\begin{array}{cc} CH_3 & OC_4H_9 \\ | & | \\ O-Si-O-Ti- \\ | & | \\ CH_3 & OC_4H_9 \end{array} \right)_n - OC_4H_9 + 2nCH_3COOC_4H_9. \qquad (2a) \qquad 2a$$

An exothermic reaction was observed already during mixing at room temperature. During heating and distillation dimethyl dibutoxy silane $(CH_3)_2$

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S/190/61/003/006/010/019
B110/B208

Reaction of butyl ...

$Si(OC_4H_9)_2$ distils over in addition to butyl acetate which quantitatively corresponds to formula 2. When a mixture $Ti(OC_4H_9)_4/(CH_3)_2Si(OCOCH_3)_2$ is distilled in a ratio 1:1, it hardens and prevents the reaction from going to completion. At ratios of 2:1 and 4:1 butyl polytitanium oxane $(C_4H_9O)_{2n+2}Ti_nO_{n-1}$ and not polytitanium siloxane is left after distillation. Alkyl orthotitanates form with acetic acid anhydride alkoxy titanium acetates according to $Ti(OR)_4+(CH_3CO)_2O \longrightarrow (RO)_3TiOCOCH_3+CH_3COOR$. These react when heated according to $(n-1)(RO)_3TiOCOCH_3-Ti(OR)_4 \longrightarrow$
$\longrightarrow (RO)_{2n+2}Ti_nO_{n-1}+(n-1)CH_3COOR$. The acyloxy compounds of silicon which are silicon anhydrides of carboxylic acids have anhydride properties. An anhydride reaction is therefore assumed to take place in the first stage according to: $2Ti(OC_4H_9)_4+(CH_3)_2Si(OCOCH_3)_2 \longrightarrow 2(C_4H_9O)_3Ti(OCOCH_3)$
$+(CH_3)_2Si(OC_4H_9)_2$ (5). It is exothermic at room temperature. The heterofunctional condensation according to $(C_4H_9O)_3TiOCOCH_3 \longrightarrow [(C_4H_9O)_2TiO]_x$
$+ CH_3COOC_4H_9$ follows.
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Reaction of butyl ...

If the molar ratio $Ti(OC_4H_9)_4/(CH_3)_2Si(OCOCH_3)_2$ exceeds the value 2:1 and is between 4:1 and 2:1, the free butyl orthotitanate in the reaction mass gives rise to the following reactions $2nTi(OC_4H_9)_4$ $+(n-1)(CH_3)_2Si(OCOCH_3)_2 \longrightarrow 2(C_4H_9O)_{2n+2}Ti_nO_{n-1} + (n-1)(CH_3)_2Si(OC_4H_9)_2$ $+ (n-1)CH_3COOC_4H_9$ (7). Studying the reaction with different molar ratios revealed that the Ti-content of the end product depends on the ratios of the reactants of formula (7). K. A. Andrianov and T. N. Ganina (Zh.obshch. khimii, 22, 605, 1959) found that in this case acetoxy groups are substituted on the titanium for the butoxy groups, forming cyclic titanium oxane compounds instead of the trimethyl siloxy titanium to be expected. $Ti(OC_4H_9)_4$ prepared from 23.4g (0.069 mole) $TiCl_4$ and butyl alcohol in the presence of ammonia, boiling at $167-168°C/4mm$, and 5.2g (0.029 mole) $(CH_3)_2Si(OCOCH_3)_2$ synthesized from dimethyl dichlorosilane and acetic anhydride (boiling point $155-161°C$; $n_D^{20}=1.401$) reacted in a ratio of 7:3. The exothermic reaction already set in during mixing in the flask

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S/190/61/003/006/010/019
B110/B208

Reaction of butyl ...

and the mass became homogeneous. During distillation on a metal bath at 200-210°C a liquid boiling at 125-127°C distilled over. On distillation of butyl acetate at 170-180°C and 3.7mm a liquid with a boiling point 89.9°C/20mm distilled over. After distillation of volatile fractions at 190-200°C and 5.6mm a viscous, transparent orange liquid with the formula $(C_4H_9O)_{16}P_4O_6$ as left (Table). The butyl acetate boiled at 124-125°C; d_4^{20} 0.8731; n_D^{20} 1.3978. The diethyl a rotary column $(CH_3)_2S(OC_4H_9)$ found in the residue had a boiling point of 74°C at 10mmHg and of 186-188 at other pressure; d_D^{20} 0.8058. 19.5 g (0.057 mole) butyl orthothiocarbonate were mixed with 5.8g (0.057 mole) acetic anhydride with a boiling point of 145-148.5°C. Like in the first experiment. The mixture got warm and homogeneous. Liquid butyl acetate were distilled and a viscous, orange liquid of orange yellow color was left $\left[(C_4H_9O)_2P_2O\right]$. Butyl polythiocarbonate was obtained in an analogous

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S/0x/r/003/016/010/019
B110/B208

Reaction of butyl ....

manner from 15.1g (0.04 mole) butyl orthotitanate and 3.1g (0.03 mole)
acetic anhydride $(C_4H_6O_3)$. There are 1 table and 12 references:
9 Soviet-bloc and 3 non-Soviet-bloc. The references to English-language
publications read as follows: Ref. 5: K. A. Frisch, P. A. Goodwin, R.
E. Scott J. Amer. Chem. Soc., 74, 4584, 1952. Ref. 12: R. O. Sauer, J.
Amer. Chem. Soc. 66, 1707 1944.

ASSOCIATION. Institut khimii Ural'skogo filiala AN SSSR
(Chemical Institute of the Ural Branch of AS USSR)

SUBMITTED: July 28, 1960

Table. Reaction of butyl orthotitanate with dimethyl diacetoxy silane.
Legend: 1) mole; 2) molar ratio I:II; 3) formula of the product to be
expected from equation; 4) elementary composition of the residue in the
flask; 5) calculated; 6) found.

Card 6/7

SUVOROV, A.L.; SPASSKIY, S.S.

Interaction of alkylorthotitanates with dibasic acid anhydrides.
Dokl. AN SSSR 157 no.3:639-642   Jl '64.   (MIRA 17:7)

1. Institut khimii Ural'skogo filiala AN SSSR. Predstavleno
akademikom A.N. Nesmeyanovym.

L 54563-65   EWT(m)/EPF(c)/EWP(j)/T   Pc-4/Pr-4   RM UR/0286/65/000/009/0071/0071
ACCESSION NR: AP5015312   678.766.7

AUTHOR: Suvorov, A. L.; Spasskiy, S. S.

TITLE: Preparation of organotitanium polymers or oligomers with unsaturated acyl
groups. Class 39, No. 170686

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 9, 1965, 71

TOPIC TAGS: organotitanium polymer, organotitanium oligomer, unsaturated polymer

ABSTRACT: An Author Certificate has been issued for a preparative method for
organotitanium polymers or oligomers with unsaturated acyl groups. The method
involves treatment of organotitanium polymers or oligomers containing alkoxy sub-
stituents at the Ti atom with anhydrides of unsaturated mono- or di-basic acids.
                                                                          [BO]

ASSOCIATION: none

SUBMITTED: 13Mar64   ENCL: 00   SUB CODE: OC, GC

NO REF SOV: 000   OTHER: 000   ATD PRESS: 4029
Card   1/1

SEMERNEVA, G.A.;SUVOROV, A.L. SAMARINA, L.A.; ALEKSEYEVA, I.A.; SPASSKIY, S.S.

Infrared spectra of some organotitanium compounds. Zhur. prikl.
spekt. 3 no. 6:555-559 D '65   (MIRA 19:1)

1. Submitted October 8, 1964.

MILITSYN, Konstantin Nikitich, kandidat tekhnicheskikh nauk; LOVCHIKOV,
Basiliy Semenovich, kandidat tkehnicheskikh nauk; SUVOROV, Artur
Mikhaylovich, inzhener;OSOKIN, N.Ye., kandidat tekhnicheskikh nauk,
retsenzent; PAVLOTSKIY, P.G., inzhener, retsenzent; ARONSHTEYN, N.A.,
inzhener, retsenzent; NOVIKOV, N.F., inzhener, retsenzent; RZHEZNIKOV,
V.S., redaktor; ARKHANGEL'SKAYA, M.S., redaktor izdatel'stva;
BEKKER, O.G., tekhnicheskiy redaktor

[Smelting and founding of nonferrous metals and alloys] Plavka i
lit'e tsvetnykh metallov i splavov. Pod nauchnoi red. K.N.Militsyna.
Moskva, Gos. nauchno-tekhn. izd-vo lit-ry po chernoi i tsvetnoi metal-
lurgii, 1956. 662 p.   (MIRA 10:2)

1. Kol'chuginskiy tekhnikum po obrabotke tsvetnykh metallov (for
Osokin, Pavlotskiy, Aronshteyn, Novikov)
        (Founding)   (Smelting)
        (Nonferrous metals--Metallurgy)

SUVOROV. A. M.

SOV/128-59-3-7/31

18(5)
AUTHOR: Suvorov, A.M., Engineer

TITLE: Casting of Shapes from Silicon

PERIODICAL: Liteynoye Proizvodstvo, 1959, Nr 3, pp 14-16 (USSR)

ABSTRACT: As the resistance to corrosion of special steel decrea-
              ses definitely at operating temperatures of 100° to
              150° Celsius, the employment of crystallized silicon,
              which is able to sustain temperatures from 500° to
              600°C., is highly interesting. Until very recently it
              had been thought unfeasible to produce shapes from
              crystallized silicon, explanatory by the specific pro-
              perties of the latter. First it was necessary to clari-
              fy the principle question, how to cast shapes from si-
              licon and to explore the necessary technological pro-
              cesses. For the experiments the silicon types KpO (not
              less than 99% silicon) and Kpl (not less than 98% sili-
              con), both made at hte plant for ferro-alloys at Chelya-
              binsk, were used. For melting the silicon a high-fre-
              quency induction heated melting pan of graphite or gra-
Card 1/3   phite grog is mostly suitable. Previously the silicon

Casting of Shapes from Silicon   SOV/128-59-3-7/31

is crushed to particles of 10 to 15 mm in diameter, and
the melting pot is pre-heated to 800^{0} to 1,000^{0} C.
Pouring into the molds is done at 1.550^{0} to 1.600^{0}C,
according to the difference in shape of the casting.
When pouring in normal atmosphere already at 1,000^{0}C
silicon anhydride (SiO_2) is formed at the surface of

the charge, which is hard to remove and which forms
non-metallic crystals in the structure of the casting.
Therefore pouring in an atmosphere of argon gas (Ar)
is the best method. A table lists the experiments made
with various work pieces, like pipes, cranes, etc.
The molds made from plaster of Paris, from gritty free-
stone, and from graphite, etc., showed all negative
results. Best results were achieved when using ceramic
molds. With different mixtures 22 tests had been made.
But ceramic molds can only be used for shapes with a
low weight. Graphite molds showed good results too,
but they were not suitable for complicated profiles
of the shapes. Castings from silicon can not be ground

Card 2/3   by means of a normal machine tool. Most suitable for

Casting of Shapes from Silicon   SOV/128-59-3-7/31

       machining is the ultra sonic process. Likewise the
cut demonstrating the micro-structure of the silicon
casting on the photo figure 3 has been made by using
the ultrasonic method. These experiments have been
made during 1956 to 1958 at the Institute of Non-Fer-
rous Metals and Gold imeni M. I. Kalinin, Chair of Foundry
Production, Moscow.   There are 1 table, 2 diagrams,
1 photograph and 1 micro-photograph.

Card 3/3

27739
S/128/61/000/006/003/004
A054/A127

18 3200

AUTHOR: Suvorov, A.M.

TITLE: Electron-beam melting

PERIODICAL: Liteynoye proizvodstvo, no. 6, 1961, 24 - 26

TEXT: Electron-beam melting is more suitable than any other known method
for the melting of highly heat-resisting metals. It keeps the bath in the liquid
phase for a long time, ensures a high degree of degassing and refines the metal
(W, Re, Mo, Nb, Ta, Ti, V and their alloys) very thoroughly. The process is also
applied in producing profile castings, in welding, etc. It is based on the kine-
tic energy of free electrons which move at a high velocity and bombard in a vacu-
um the metal being melted under the effect of great differences in potential.
The greater part of the energy is separated and transformed into heat during the
bombardment, this heat being used for the melting of the metal. In the electron
gun the cloud of free electrons develops around the cathodes heated to 2,000 -
2,500°C. The rate of melting depends on the gas content of the metal, the volt-
age between anode and cathode (generally 12 - 20 kv), their arrangement and the
degree of vacuum in the gun. Stable operation and maximum rates of melting are

Card 1/4

Electron-beam melting

ensured by a vacuum system, producing pressures of up to 1.10^{-4} Hg in the working space and 1.10^{-6} Hg in the gun. A high vacuum can be obtained by using several pumps (e.g., steam-oil pumps with 3,000 - 8,000 l/sec capacity), while for high-capacity electron-beam installations diffusion, booster or forevacuum pumps with outputs up to 42,000 l/sec should be used. The vacuum in the electron gun will be higher by using intermediate diaphragms and a self-contained vacuum system to pump out the air from the electrode area, and several pumps for the focussing and deflecting devices. The automatic voltage and current control is effected by an intricate electronic system compensating the resistance variations between anode and cathode and controlling the electric parameters of the electron beam during the melting process. The electron gun is produced in different designs depending on the application. The cathode is either a tungsten spiral wire, 0.25 - 0.3 mm in diameter, or a disk 20 mm in diameter made of tungsten, rhenium or tantalum. When the installation is used for zone melting the cathode has the shape of a ring fitted with special reflectors. The same installation can be used for the melting of metals consisting of different charges, e.g., with consumable electrode or dosing of individual portions. The electron-beam melting installations used at present have a power of 45 - 1,500 kw and produce ingots of different high-melting metals 25 - 200 mm in diameter. To obtain larger ingots, either the beam

Card 2/4

Electron-beam melting

27739
S/128/61/000/006/003/004
A054/A127

power or the number of guns has to be increased. In the first case the voltage
must be raised above 20,000 v, therefore, it is more economical and simpler to use
two electron guns, such an installation being described by the author. Melting
by electron bombardment, compared with other methods, has a number of considerable
advantages, since it is carried out in a high vacuum and intense and protracted
overheating of the melt is possible. Theoretically, an upper temperature limit
does not exist with electron-beam melting; the temperature is only limited by
the practical boiling and evaporation of the metal being melted. The metal is
degassed and refined from nonmetallic and metallic impurities rather efficiently.
Iron, aluminum, nickel and chromium evaporate in the first place; nonmetallic
impurities like carbon, oxygen and nitrogen are eliminated in the form of carbon
monoxide, metal monoxides and nitrides. Nonmetallic impurities overheat more than
metallic ones and evaporate considerably more intensive. A table presents data
characterizing the changes in the chemical composition of tantalum and hafnium
smelted by electron bombardment. The degree of metal refinement in electron-beam
melting attains such values that the content of ordinary elements is below the
sensitivity threshold of analysis (Ref. 3: W. Scheibe, Metall Zeitschrift für
Technik, Industrie und Handel, no. 5, 1960). Concluding, the author discusses
some problems and ways of metal reduction in electron-beam melting. There are 7

Card 3/4

Electron-beam melting

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S/128/61/000/006/003/004
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figures, 1 table and 3 non-Soviet-bloc references. The reference to the English-
language publication reads as follows: Journal less Common Metals, no. 2, 104,
1960.

Card 4/4

S/0166/63/000/005/0090/0094

ACCESSION NR: AP4002547

AUTHORS: Lyutovich, A. S.; Sinyukov, V. A.; Mamanov, O. A.; Suvorov, A. N.; Gudoshnikov, A. V.

TITLE: Investigation of purity and structural perfection of monocrystalline silicon by measuring Hall effect in whole ingots

SOURCE: AN UzSSR. Izvestiya. Seriya fiziko-matem. nauk, no. 5, 1963, 90-94

TOPIC TAGS: silicon, monocrystalline silicon, silicon purity measurement, Hall effect

ABSTRACT: The crystal purity in single crystal silicon has been investigated by measuring the Hall effect in whole ingots. The study is based on the expression for the mobility μ of the charge carriers as a function of the Hall emf V_x, thus

$$\mu = \frac{V_z S}{H I \rho d},$$

Card 1/2

ACCESSION NR: AP4002547

where H – magnetic field, ρ – resistivity, d – ingot diameter, S – cross-section area, I – current in ma. The experiment was performed with bars 3-25 cm long and 1-2.5 cm in diameter. After Hall emf measurements on the complete specimen were completed several smaller specimens were cut out and the measurements repeated. The results show the possibility of Hall measurements directly on the whole specimen, without any need for cutouts or incisions (which in turn show the expected relationship between p, n and μ). The dislocation distribution shows large dislocation densities at the start of the ingot, close to the nucleus, gradually decreasing toward the end. Orig. art. has: 3 formulas and 3 figures.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN UzSSR (Physical-Technical Institute AN UzSSR)

SUBMITTED: 30Jul63   DATE ACQ: 07Jan64   ENCL: 00

SUB CODE: PH   NO REF SOV: 001   OTHER: 002

Card 2/2

S/0166/64/000/003/0074/0075

ACCESSION NR: AP4044797

AUTHOR: Lyutovich, A. S., Sinyukov, V. A., Mamanov, O. A., Suvorov, A. N., Gudoshnikov, A. V.

TITLE: Controlling the quality of polycrystalline silicon by measuring its electrophysical parameters

SOURCE: AN UzSSR. Izvestiya. Seriya fiziko-matematicheskikh nauk, no. 3, 1964, 74-75

TOPIC TAGS: polycrystal, monocrystal, electrophysical parameter, conductivity, charge carrier, resistivity, silicon, polycrystalline silicon

ABSTRACT: The paper describes the quality control of polycrystalline silicon by measurement of electrophysical parameters such as the type of conductivity, specific resistance, concentration of charge carriers and their mobility. The method described for polycrystals is, in principle, the same as the analogous control technique for monocrystals. Studies have shown, however, that the specific resistance of polycrystals should be measured at higher current densities than with monocrystals. Figure 1 in the Enclosure shows some of the experimental results. Orig. art. has: 2 figures.

Card 1/3

ACCESSION NR: AP4044797

ASSOCIATION: Fiziko-tekhnicheskiy Institut AN UzSSR(Institute of Physics and Technology, AN Uz SSR)

SUBMITTED: 04Dec63   ENCL: 01

SUB CODE: IC   NO REF SOV: 002   OTHER: 001

Card 2/3

44688
S/869/62/000/000/012/012
B102/B186

AUTHORS: Broder, D. L., Leshuk, A. I., Sadokhin, I. P., Suvorov, A. P.

TITLE: Inelastic scattering of neutrons from iron nuclei

SOURCE: Teoriya i metody rascheta yadernykh reaktorov; sbornik
             statey. Ed. by G. I. Marchuk. Moscow, Gosatomizdat, 1962,
             254 - 259

TEXT: The aim of the work was to determine the energy dependence of the
inelastic scattering cross section in the range 0.80 - 4.0 Mev by ana-
lyzing experimental data as accurately as possible. Supplementary exper-
iments were carried out to provide missing data. The reaction $T^3(p,n)He^3$
was used as a source of neutrons for the 0.80 - 2.5 Mev range, and
$D(d,n)He^3$ for 2.5 - 4 Mev. The γ-ray detector was an NaI(Tl) crystal with
a $\Phi \ni Y$ -13(FEU-13) photomultiplier. Hence the pulses were fed through an
amplifier to a 128-channel pulse-height analyzer. The investigations were
carried out for the components of the most abundant natural isotopic com-
position: 91.68 % Fe^{56}, 5.48 % Fe^{54}, 2.17 % Fe^{57} and 0.31 % Fe^{58}. The
cross sections of the γ-quantum yield when neutrons of various energies

Card 1/2

ACCESSION NR: AT4019041

S/0000/63/000/000/0132/0142

AUTHOR: Broder, D. L,; Lashuk, A. I.; Sadokhin, I. P.; Suvorov, A. P.

TITLE: Selection of a system of excitation functions for the energy levels during inelastic scattering of neutrons by the nuclei of iron, nickel and niobium

SOURCE: Voprosy* fiziki zashchity* reaktorov; sbornik statey (Problems in physics of reactor shielding; collection of articles). Moscow, Gosatomizdat, 1963, 132-142

TOPIC TAGS: neutron, neutron scattering, inelastic neutron scattering, excitation function, Gamma ray spectrum, energy level cross section, iron nucleus, nickel nucleus, niobium nucleus, nuclear reactor, reactor shielding

ABSTRACT: Cross sections of the energy levels produced during the inelastic scat-tering of neutrons by the nuclei of iron, nickel and niobium were investigated by measuring the spectrum of the γ-rays created by the degradation of the excited, states. The neutron sources were the reaction $T^3(p,n)$ He^3 obtained in a Van der Graaf generater for the energy range 0.8-2.5 Mev and the reaction $D(d,n)$ He^3 in a cascade accelerator for the range 2.5-4.0 Mev. The γ-ray spectrometer consisted of a NaI(Tl) crystal, an FEU-13 photomultiplier and a 128-channel pulse analyzer. Monitoring of the neutron flux was performed with a boron counter and a U^{235}

Card 1/2

L 04224-67   EWT(m)

ACC NR: AR6031857   SOURCE CODE: UR/0058/66/000/006/V049/V049

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13

AUTHOR: Suvorov, A. P.

TITLE: Group constants for fast neutrons in iron, hydrogen and water (P_7-approximation)

SOURCE: Ref. zh. Fizika, Abs. 6V404

REF SOURCE: Byul. Inform. tsentra po yadern. dannym, vyp. 2, 1965, 320-327

TOPIC TAGS: fast neutron, neutron distribution, neutron energy distribution, neutron scattering

ABSTRACT: It is noted that spatial, energy, and angular distributions of neutrons during their passage through various media require the application of computational methods with a sufficiently high degree of approximation. Using the method of spherical harmonics or variations of it, constants are given for the calculation of fast neutron distribution. For the compilation of group constants, use was made of data available in literature on the cross-sections of elastic and nonelastic scattering and total cross-sections, as well as on the angular distributions of scattered neutrons. Scattering on hydrogen nuclei in the center-of-mass system was consider-

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L 04224-67

ACC NR: AR6031857

ed isotropic. At energies of $E > 4$ Mev for iron nuclei and $E > 10$ Mev for oxygen nuclei, it was assumed that the statistical model of the nucleus was correct and that the nucleus excitation temperature was 0.8 Mev for iron and 0.9 Mev for oxygen. The results are submitted in the form of tables. It is noted that the suggested constants are intended for calculating the passage of neutrons in fairly extensive media. [Translation of abstract]

SUB CODE: 18, 20/

Card 2/2

S/0089/65/018/003/0278/0282

L 45589-65   EWT(m)/EWA(h)   DM

ACCESSION NR: AP5009124

AUTHOR: Suvorov, A. P.; Guseynov, A. G.; Nikolayev, M. N.

TITLE: Effective resonance structure of the cross sections on the anisotropy of scattering of fast neutrons and on their passage through iron

SOURCE: Atomnaya energiya, v. 18, no. 3, 1965, 278-282

TOPIC TAGS: resonance cross section, fast neutron scattering, reactor shielding, iron shield

ABSTRACT: The article deals with the influence of the resonance structure of cross sections on the passage of fast neutrons through iron, which is extensively used in reactor shields. The experimental set-up is shown in Fig. 1 of the Enclosure. The fast neutrons were obtained from the active zone of a BR-5 reactor. The scattered neutrons were registered with a multiple-layer ionization fission chamber with Th232. Measurements were made of the counting rates of the detector behind an absorber of given thickness and of the counting rate of a detector of neutrons passing through some absorber and scattered at a specified angle. The experimental results are compared with various calculations. It is concluded that the resonance

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L 45589-65

ACCESSION NR: AP5009124

structure of the cross sections greatly influences the passage of neutrons through media consisting of medium-weight nuclei. A large slowing-down effect is to be expected at lower energies (1.5--2 MeV). When account is taken of the influence of the resonance structure of the cross sections, it becomes necessary to include the effect of screening on the angular distriubtions and use the subgroup method for accurate calculations. "The authors thank the late I. I. Bondarenko, V. V. Orlov, and A. A. Luk'yanov for interest in the work and for valuable remarks." Orig. art. has: 3 figures, 9 formulas, and 3 tables.

ASSOCIATION: None

SUBMITTED: 15Jun64   ENCL: 01   SUB CODE: NP

NR REF SOV: 005   OTHER: 007

Card 2/3

L 05055-67   EWT(m)   JR/GD

ACC NR: AT6027917   SOURCE CODE: UR/0000/66/000/000/0005/0021

AUTHOR: Orlov, V. V.; Abagyan, A. A.; Fedorenko, R. P.; Dubinin, A. A.; Suvorov, A. P.

ORG: None

TITLE: Optimizing the physical characteristics of radiation shielding

SOURCE: Voprosy fiziki zashchity reaktorov (Problems in physics of reactor shielding); sbornik statey, no. 2. Moscow, Atomizdat, 1966, 5-21

TOPIC TAGS: radiation shielding, variational problem, successive approximation, perturbation theory, REACTOR SHIELDING

ABSTRACT: The authors consider the problem of selecting the ratio of components in reactor shielding to give minimum weight or overall dimensions for a given reduction in radiation intensity or to achieve a minimum radiation dose for given shielding weight or dimensions. The problem is formulated as a variational problem on the optimum of some quantity when given conditions are imposed on other quantities. The various approaches to solution of the problem given in the literature are briefly reviewed. The physical characteristics of the shielding (neutron and gamma doses, heat release, weight, etc.) are considered within the framework of perturbation theory and the concept of functions of effectiveness of shielding materials is intro-

Card 1/2

L 05052-67   EWT(m)   JR/GD

ACC NR: AT6027918   SOURCE CODE: UR/0000/66/000/000/0022/0039

AUTHOR: Germogenova, T. A.; Suvorov, A. P.; Utkin, V. A.

ORG: None

TITLE: Penetration of neutrons through plane-parallel multilayer media

SOURCE: Voprosy fiziki zashchity reaktorov (Problems in physics of reactor shielding); sbornik statey, no. 2. Moscow, Atomizdat, 1966, 22-39

TOPIC TAGS: neutron radiation, finite difference, computer programming, radiation shielding , *RADIATION INTENSITY*

ABSTRACT: A finite-difference method is proposed for a numerical solution of a one-dimensional kinetic equation describing the penetration of radiation through a material in terms of complex functions of energy, angles and spatial coordinates. This method is based on the multigroup system of analysis and gives high accuracy while requiring a comparatively small amount of machine time. In solving the finite-difference system, the coefficients of transmission and reflection are calculated for a sequence of layers increasing in thickness and these coefficients are then used for finding the approximate values of radiation intensity. This method is not as sensitive as iteration methods to an increase in the dimensions of the system or to steep gradients in the coefficients. The method is used for analyzing the passage of radi-

Card 1/2

L 05050-67   EWT(m)   JR/GD
ACC NR: AT6027920   SOURCE CODE: UR/0000/66/000/000/0057/0066

AUTHOR: Germogenova, T. A.; Suvorov, A. P.; Utkin, V. A.; Bass, L. P.   36
                                                                                                                    B+1
ORG: None   19

TITLE: Neutron transfer in nonmultiplying systems with spherical symmetry

SOURCE: Voprosy fiziki zashchity reaktorov (Problems in physics of reactor shield-
ing); sbornik statey, no. 2. Moscow, Atomizdat, 1966, 57-66   19

TOPIC TAGS: neutron radiation, radiation source, scattering cross section

ABSTRACT: The literature on methods for solution of radiation transfer problems is
briefly reviewed and the problem of an isotropic point source is considered. Since
the problem of an isotropic point source in an infinite medium has been studied in
more detail in transfer theory than the case of a bounded medium, the solutions for
these problems are compared on the basis of the one-velocity model with isotropic
scattering for spheres with finite and infinite radii. A comparison of formulas de-
scribing the asymptotic behavior of the density of a finite sphere with a large radius
shows that the results of calculations of the density of scattered radiation from a
point source in an infinite homogeneous medium may be directly used for determining
the density only when absorption is less than 1 everywhere except in the region ad-
jacent to the boundary $r=R$. Orig. art. has: 6 figures, 9 formulas.

SUB CODE: 20, 18/ SUBM DATE: 12Jan66/ ORIG REF: 007/ OTH REF: 002

Card 1/1 plo)

L 05047-67　EWT(m)/EWP(t)/ETI　IJP(c)　JD/JR/GD

ACC NR:　AT6027923　　　　　SOURCE CODE:　UR/0000/66/000/000/0074/0087

AUTHOR:　Germogenova, T. A.; Suvorov, A. P.; Utkin, V. A.

ORG:　None

TITLE:　Angular energy spectra for fast neutrons behind iron shielding

SOURCE:　Voprosy fiziki zashchity reaktorov (Problems in physics of reactor shielding); sbornik statey, no. 2. Moscow, Atomizdat, 1966, 74–87

TOPIC TAGS:　fast neutron, radiation shielding, angular distribution, neutron distribution, neutron spectrum

ABSTRACT:　The authors give some results from calculations of the energy and angular distributions of fast neutrons behind flat iron plates of various thickness. In finding the differential intensity of a stream of neutrons $F(x, \mu, \phi, E)$ of energy E at a depth x in the direction Ω determined by the angles $\theta = \cos^{-1}\mu$ (with the x-axis) and ϕ (azimuth), the kinetic equation

$$\mu \frac{\partial F}{\partial x} + \sum (x, E) F(x, \mu, \varphi, E) = \int d\Omega' \int_{E}^{E_{max}} dE' \sum_{s} (E' \to E, \Omega'\Omega) F(x, \mu', \varphi', E')$$

was used together with boundary conditions describing the angular and energy distribu-

Card　1/2

L 05046-67   EWT(m)/EWP(t)/ETI   IJP(c)   JD/JR/GD
ACC NR: AT6027924   SOURCE CODE: UR/0000/66/000/000/0088/0103

AUTHOR: Broder, D. L.; Zhilkin, A. S.; Kutuzov, A. A.; Suvorov, A. P.

ORG: None

TITLE: Spectra of fast neutrons in heavy homogeneous media

SOURCE: Voprosy fiziki zashchity reaktorov (Problems in physics of reactor shielding);
sbornik statey, no. 2. Moscow, Atomizdat, 1966, 88-103

TOPIC TAGS: fast neutron, neutron energy distribution, radiation shielding, neutron
scattering

ABSTRACT: The spectra of fast neutrons in iron and lead are measured directly and the
asymptotic spectra are calculated in the P_4-th approximation of the method of spherical
harmonics using recent measurements for the excitation functions on individual levels
in iron and lead. Approximate account is taken of neutron moderation in elastic scat-
tering, and anisotropy due to direct interaction in inelastic scattering. Experimental
measurements of the spatial energy distributions of neutrons were done on iron and lead
specimens measuring 710×710×600 mm. Two reactions were used as neutron sources:
$T(d,n)He^4$ (14.9 mev) and $D(d,n)He^3$ (3.35 mev). Since the deuterium target had a thick-
ness of 20 mg/cm², the resultant neutron spectrum in the latter case is not monochroma-
tic. This fact was taken into consideration in the calculations. The neutron spectro-

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L 05046-67

ACC NR: AT6027924

meter was a stilbene crystal combined with an FEU-13 photomultiplier and a 100-channel amplitude analyzer. The theoretical and experimental spectra for iron and lead are compared and show generally satisfactory agreement. Orig. art. has: 9 figures, 1 table, 32 formulas.

SUB CODE:18,20/ SUBM DATE: 12Jan66/ ORIG REF: 011/ OTH REF: 010

Card 2/2

L 05044-67   EWT(m)   JD/GD

ACC NR: AT6027928   SOURCE CODE: UR/0000/66/000/000/0123/0140

43

AUTHOR: Orlov, V. V.; Suvorov, A. P.

B+1

ORG: None

TITLE: Irradiation integral as a function of the neutron energy spectrum and the optimum structure for radiation shielding in a reactor vessel

SOURCE: Voprosy fiziki zashchity reaktorov (Problems in physics of reactor shielding); sbornik statey, no. 2. Moscow, Atomizdat, 1966, 123-140

TOPIC TAGS: neutron spectrum, radiation shielding, radiation damage

ABSTRACT: The literature on radiation damage in solids and optimum structure of radiation shielding is briefly reviewed and the radiation effect of neutrons on steel is considered. The study is simplified by restriction to the main component of steel, i. e. iron, disregarding the remaining alloying elements. Models of radiation damage in metals are described and applied to the selection of optimum structure for radiation shielding in nuclear reactor vessels. It is shown that the characteristics of optimum compositions for radiation shielding are considerably dependent on the method used for description of radiation damage in the materials used. The expressions derived in the paper are illustrated by application to iron-water shielding. The results may be used for calculating the irradiation integral of reactor vessels and for selecting optimum radiation shielding. In conclusion the authors thank V. I. Liforov for carrying out the numerical calculations. Orig. art. has: 8 figures, 1 table, 32 formulas.

SUB CODE: 18/ SUBM DATE: 12Jan66/ ORIG REF: 014/ OTH REF: 017

Card 1/1   pla

ACC NR: AR6031862   SOURCE CODE: UR/0058/66/000/006/V068/V068

AUTHOR: Suvorov, A. P.; Utkin, V. A.

TITLE: Passage of fission neutrons through iron plates

SOURCE: Ref. zh. Fizika, Abs. 6V559

REF SOURCE: Byul. Inform. tsentra po yadern. dannym, vyp. 2, 1965, 334-340

TOPIC TAGS: neutron beam, neutron angular distribution, fast neutron, neutron energy spectrum, collimated scintillation spectrometer, fission neutron

ABSTRACT: The results of calculations by the method of "transmission matrix" in the $2P_7$-approximation are compared with experimental data based on measurements of iron layers 5 and 15 cm thick of fast neutron angular energy spectra by means of a collimated scintillation spectrometer. The plates were irradiated by a plane monodirected beam of neutrons emerging from the reflector of a uranium-water reactor. Agreement between experimental and computational data in describing the angular distribution of neutrons is satisfactory. A certain divergence is explained by the use in the calculation of group constants adapted for the calculation of expanded media. Results are given of the calculation of angular distributions of

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ACC NR: AR6031862

neutrons reflected from the plates and for neutron angular distribution depending on the depth of penetration into the plate. [Translation of abstract]

SUB CODE: 20, 09/

Card 2/2

AUTHOR: Goryachev, I. V.; Dulin, V. A.; Yermakov, S. M.; Kolyzhenkova, V. V.; Suvorov, A. P.; Trykov, L. A.

ORG: none

TITLE: Angular distribution of fast neutrons behind iron shields

SOURCE: Atomnaya energiya, v. 20, no. 6, 1966, 469-473

TOPIC TAGS: neutron distribution, fast neutron, angular distribution, reactor shielding, iron

ABSTRACT: The authors have measured the angular and energy distributions of fast neutrons behind iron shields of 10 and 15 cm thickness. The results of the experiment are compared with calculations by the Monte Carlo method and with many-group calculations by the "transmission" matrix method in the $2P_7$ approximation. The results of the calculations show that the transmission of the shield depends strongly on the angular distribution of the incident radiation. The transmission measurements were made using an RIZ uranium-water reactor with a stainless steel reflector. The agreement of the experimental and the calculated data are found to

Card 1/2   UDC: 539.125.52

L 11394-67 EWT(m)/EWP(w)/EWP(t)/ETI IJP(c) JH/JD
ACC NR: AR6023314   SOURCE CODE: UR/0271/66/000/003/0008/0008

AUTHOR: Pavlov, I. M.; Mekhed, G. N.; Suvorov, V. A.

TITLE: Effect of temperature on the mechanical properties of iron-aluminum alloys

SOURCE: Ref. zh. Mashinostr mat konstr i raschet detal mash. Gidropr, Abs. 3.48.57

REF SOURCE: Tr. Mosk. in-ta stali i splavov i Mosk. energ. in-ta, vyp. 61, ch. 1,
1965, 169-179

TOPIC TAGS: iron aluminum alloy, aluminum alloy property, ductility, ultimate strength

ABSTRACT: Fe-Al alloys were studied with aluminum concentrations of 8.00, 11.50,
14.00 and 16.50% conditionally designated as Yu8, Yu12, Yu14 and Yu16 respectively.
Alloys with an aluminum concentration of 12% or more have low ductility ($\delta < 5\%$, $\psi < 5\%$
and $a_K < 1.3$ kg/cm^2) and are brittle at room temperature. The mechanical properties of
iron-aluminum alloys depend on temperature and aluminum concentration. There is a
sharp increase in strength characteristics at 100-200°C. The alloys may be divided
into two groups on the basis of σ_b as a function of temperature. Alloys in the first
group (Yu8 and Yu12) show little change in σ_b (less than 4%). In the second group
(Yu14 and Yu16) σ_b increases (up to 40%) as the temperature is raised. Alloys with

UDC: 669.15'71

Card 1/2

L 11244-67
ACC NR: AR0023314

' an aluminum concentration from 8 to 16.5% have two maxima on a_x curves. An increase in the concentration of aluminum in the alloy is accompanied by a reduction in the first maximum (from 32 to 10 kg/cm^2) with a shift toward higher temperatures (from 200 to 450°C). At 800°C, σ_b and δ are only slightly dependent on aluminum concentration and show similar values for Yu8, Yu12 and Yu14 alloys. [Translation of abstract]

SUB CODE: 11

Card 2/2   jb

ACC NR: AP7000798   (A, N)   SOURCE CODE: UR/0089/66/021/005/0392/0394

AUTHOR: Degtyarev, S. F.; Kukhtevich, V. I.; Suvorov, A. P.; Tarasov, V. V.; Tikhonov, V. K.; Tsypin, S. G.

ORG: none

TITLE: Angular distributions of fast neutrons emerging from hydrogen-containing media

SOURCE: Atomnaya energiya, v. 21, no. 5, 1966, 392-394

TOPIC TAGS: fast neutron, neutron distribution, lithium compound, water, neutron radiation, radiation intensity, neutron shielding, neutron detector

ABSTRACT: The authors report results of experiments on the angular distributions of the flux (dose intensity) of fast neutrons with energy $E > 0.7$ Mev, emerging from plates of lithium hydride of 0.5 g/cm³ density and 15, 30, 45, and 60 cm thick, and from layers of water 15 and 45 cm thick. The radiation source was a collimated beam of neutrons (plane unidirectional source). The neutron spectrum was similar to that of the BSR reactor. The measurements were made for angles 0 - 55°. The neutrons were registered with a fast-neutron scintillation detector consisting of a Plexiglas tablet with ZnS(Ag) admixture, secured to the end window of a photomultiplier (FEU-59). The results show that for angles larger than 10° a change in the plate thickness has little effect on the form of the angular distribution. At angles 0 - 10°, the neutron flux exhibits a pronounced peak due essentially to unscattered neutrons. With increasing thickness of lithium-hydride plates, the height and width of this

Card 1/2   UDC: 539.125.5: 539.121.72

ACC NR: AP7000798

peak decrease, owing to the increase in the fraction of scattered neutrons. The re-
sults for lithium agree satisfactorily with results of many-group calculations by
the authors (Voprosy fiziki zashchity reaktorov [Problems in the Physics of Reactor
Shielding], edited by D. L. Broder et al., no. 2, M., Atomizdat, 1966, p. 18). The
results for lithium and water are likewise in good agreement with similar measure-
ments by others. The results also show that there is little difference in the data
for lithium hydride, polyethylene, and water, the results agreeing within 20% at
angles 20 - 60°, and by not more than 30% at smaller or larger angles. The authors
used results of individual measurements by L. A. Trykov and I. V. Goryachev. Orig.
art. has: 5 figures and 2 formulas.

SUB CODE: 20,18/   SUBM DATE: 05Jul66/   ORIG REF: 002/   OTH REF: 003

Card 2/2

RYAUZOV, V.S.; SUVOROV, A.S.; SMIDOVICH, Ye.V.

Grinding powder material by gas expansion. Trudy MINKHiGP no.37:
165-175 '62.

(MIRA 17:3)

SUVOROV, A.S.

For systematic exchange of experience on architectural roadside
improvements. Avt.dor.17 no.1:10-11 Jl-Ag'54.   (MLRA 8:10)
                (Roadside improvements)

SUVOROV, A.S., inzhener.

Experience in laying out a bitumen base.   Avt.dor. 18 no.8:17-18
D '55.   (MLRA 9:5)
        (Bituminous materials) (Road construction)

GURVICH, V.L. [deceased]; SKOBLO, A.I.; SMIDOVICH, Ye.V.; ZAYTSEVA, N.P.;
        KAZANSKAYA, N.S.; PETROV, V.N.; SUVOROV, A.S.; SHCHERBAKOV, A.A.

    Continuous coking of heavy petroleum residues on powdered coke.
    Trudy MINKHiGP no.24:298-310 '59.   (MIRA 13:3)
                    (Petroleum coke)

KORZHENEVSKIY, I.V.; LOYENKO, A.A.; CHEREVKOV, V.A.; SUVOROV, A.S.

Control of landslides on mountain roads. Avt.dor. 24 no.4:13-15
. Ap '61.   (MIRA 14:5)
        (Road construction)   (Landslides)

SUVOROV, A.S.; ZYMB YOM; SHIDOVICH, Yo.V.

Laboratory apparatus with a powder-catalyst fluidized bed. Nefteper.
i neftekhim. no.6:16-17 '64.   (MIRA 17:9)

1. Moskovskiy ordena Trudovogo Krasnogo Znameni institut neftekhimi-
cheskoy i gazovoy promyshlennosti im. akad. Grubkina.

SUVOROV, A.S.

Aesthetics of Crimean roads. Avt.dor. 28 no.11:18-19 N '65.

(MIRA 18:11)

1. Nachal'nik dorozhno-ekspluatatsionnogo uchastka No.592 pervogo upravleniya dorog Glavnogo upravleniya shosseynykh dorog UkrSSR.

DOBROTIN, R.B.; SUVOROV, A.V.; KONDRAT'YEV, Yu.V.

Problem of phase transitions in solids.   Vest. LGU   19   no.4:
95-98 '64.

(MIRA 17:3)

SUVOROV, A V.

USSR/Chemistry - Liquid Oxygen Equipment

SUVOROV, A. V.

FD 183

Card 1/1

Author   : Suvorov, A. V.

Title   : Accelerated heating of the separation apparatus of an oxygen installation

Periodical : Khim. prom. 3, p 58 (186), April-May 1954

Abstract   : Describes a procedure whereby the time necessary for heating of the separation apparatus of an oxygen installation of type SK-05 manufactured by the "Komsomolets" plant and employed at the "Armalit" plant was reduced by a factor of 6-8. The editors of the periodical suggest that the procedure proposed by the author be taken into consideration by the Main Oxygen Administration in connection with the manufacture of oxygen installations. No references.

Suvorov, A.V.

tetrabromide with lithium

2

SHCHILAREV, S.A.; NOVIKOV, G.I.; SUVOROV, A.V.

Feasibility of applying the Lambert-Beer law to the study of
gaseous systems in a wide temperature range. Report No.1.
Zhur. neorg. khim. 1 no.11:2433-2439 N '56.   (MLRA 10:5)
    (Gases--Spectra) (Vapors--Spectra)

SOV/78-3-12-7/36

AUTHORS: Shchukarev, S. A., Novikov, G. I., Suvorov, A. V., Bayev, A. K.

TITLE: Optical and Tensiometric Investigation of the Chlorides of
              Hexavalent Tungsten (Opticheskoye i tenzimetricheskoye
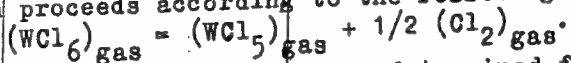   issledovaniye khloroproizvodnykh shestivalentnogo vol'frama)

ABSTRACT: Several equilibria pertaining to the chlorine derivatives of
              hexavalent tungsten in the series WO_3-WO_2Cl_2-$WOCl_4$-WCl_6 were
              investigated. Optical and tensiometric methods were used in
              determining the products of the thermal decomposition. The
              starting materials were produced by chlorinating WO_3 with CCl_4.
              At 310-330°C WO_2Cl_2 is obtained in ratio to the WO_3 and CCl_4
              of 1:2. WCl_6 is produced at 290-300° and 80-100 atmospheres.
              The purity of the starting product was found to be satisfactory.
              The absorption spectra of the WCl_6 and $WOCl_4$ were measured
              over the interval 4000-8000 Å. The optical density of the vapor
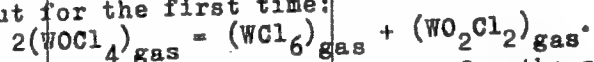
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SOV/78-3-12-7/36

Optical and Tensiometric Investigation of the Chlorides of Hexavalent Tungsten

phase from the decomposition of the WCl_6 was measured. The decomposition proceeds according to the following equation:
$$(WCl_6)_{gas} = (WCl_5)_{gas} + 1/2 (Cl_2)_{gas}.$$
The absorption coefficient x_{WCl_6} was determined for the saturated vapor, and the average value was found to be 0.46 ± 0.05. From the tensiometric data the melting and boiling temperatures of the β-form of WCl_6 could be calculated. Using the optical and tensiometric methods the thermodynamic investigation of the following disproportionation process was carried out for the first time:
$$2(WOCl_4)_{gas} = (WCl_6)_{gas} + (WO_2Cl_2)_{gas}.$$
From the optical and tensiometric data for the saturated vapors and using the linear relationship $\lg P = f(1/T)$ and $\lg D = f(1/T)$ it was found that the absorption coefficient $x_{WOCl_4} = 0.028 \pm 0.3$. The change in the free energy in this reaction is expressed in th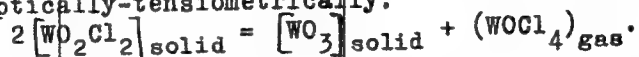e following equation: $\Delta F^o{}_{solid} = 15100$ cal $-$ 13,4 energy units $\cdots .T.$ The following disproportionation

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Optical and Tensiometric Investigation of the Chlorides of Hexavalent Tungsten

SOV/78-3-12-7/36

process of WO_2Cl_2 was investigated thermodynamically and confirmed optically-tensiometrically:

$$2\left[WO_2Cl_2\right]_{solid} = \left[WO_3\right]_{solid} + (WOCl_4)_{gas}.$$

The change in free energy in the process is expressed in the following equation: $\Delta F^o_{solid} = 29100\ cal - 42.9\ cal/degree(en.\ ed.)$

.T. The results show that the optical and tensiometric methods can be applied successfully to the determination of the partial composition of complicated gas systems. There are 11 figures, 8 tables, and 15 references, 6 of which are Soviet.

SUBMITTED: September 5, 1957

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SOV/78-4-9-22/44

5(2)
AUTHORS: Shchukarev, S. A., Novikov, G. I., Suvorov, A. V., Maksimov, V. K.

TITLE: The Thermographical Investigation of the Systems WCl_6 - WO_3, WCl_6 - WO_2, WCl_6 - $MoCl_5$

ABSTRACT: Tungsten oxychlorides are only occasionally described in publications. However, as tungsten forms a considerable number of oxides and chlorides, a corresponding number of oxychlorides may be expected. The equipment used in the investigation is schematically drawn in figure 1. One of the thermograms drawn by means of two M-21 reflecting galvanometers is given in figure 2 as an example. A scheme of the electric furnace is shown in figure 3. Figure 4 represents the melting-point diagram of the system WCl_6 - WO_3. From this it is evident that two oxychlorides are formed in the system $WOCl_4$ and WO_2Cl_2. From the melting-point diagram of the system WCl_6 - WO_2 (Fig 5) three hitherto unknown oxychlorides were deduced:

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The Thermographical Investigation of the Systems   SOV/78-4-9-22/44
WCl_6 - WO_3, WCl_6 - WO_2, WCl_6 - $MoCl_5$

$3WCl_6 \cdot WO_2$, $WCl_6 \cdot WO_2$ (or $WOCl_3$), and $WCl_6 \cdot 3WO_2$. A simple eutectic
and regions of partial solubility in the solid phase were
ascertained in the melting-point diagram of the system
WCl_6 - $MoCl_5$ (Fig 6). There are 6 figures and 5 references,
1 of which is Soviet.

SUBMITTED: June 16, 1958

Card 2/2

24 (7), 5 (4)
AUTHORS: Suvorov, A. V., Shchukarev, S. A.,   SOV/48-23-10-30/39
               Novikov, G. I.

TITLE: On the Possibility of a Molecular Spectral Analysis of Vapors
               Within a Wide Temperature Range

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1959,
               Vol 23, Nr 10, pp 1248-1250 (USSR)

ABSTRACT: For the analysis of gas- and vapor mixtures it is possible to
               use the spectrum of this mixture in the visible-, in the
               ultraviolet-, or in the infrared range; whereas in the ultra-
               violet range the quantum energies are already so high that
               un-called-for photochemical reactions occur, the strong
               influence exercised by temperature in the infrared range is a
               disturbing factor. For the investigation of a complex system
               in equilibrium, a spectroscopic method is, in any case,
               insufficient, because it is necessary, besides the partial
               component pressures, to know also the total pressure in the
               system. For their determination it is possible to employ any
               statistical method, but the membrane method (with zero
               manometer) was found to be especially useful. It was found
               that the amount of absorption is influenced by pressure, and

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On the Possibility of a Molecular Spectral Analysis of   SOV/48-23-10-30/39
Vapors Within a Wide Temperature Range

still more by temperature. The temperature dependence of the
amount of absorption has hitherto not been quantitatively
investigated. Such an empirical method was the aim to be
fulfilled by the authors. An investigation of the temperature-
dependent variation of absorption and optical density in
iodine vapors resulted in the formula $K_y = x_y T$, where x_y

is a quantity which is independent of temperature. For its
verification the system $N_2O_4 - NO_2 - NO - O_2$ was investigated

in the range 18-480°C. Figure 3 shows the measured temperature
dependence of the pressure p and of the optical density D. The
diagram may be divided into 3 ranges: I) 18-100°, equilibrium
$N_2O_4 = 2NO_2$, II) 100-200°, pure NO_2, III) 200-480°, equilibrium
$2NO_2 = 2NO + O_2$. By using the Lambert-Beer law a formula may

be derived for the determination of x_y: $x_y = (D_y/p)(R/d)$.

For a given frequency the following is thus obtained:

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28 (5)
AUTHORS: Novikov, G. I., Suvorov, A. V.   SOV/32-25-6-40/53

TITLE: Membrane Zero Pressure Gauge for the Measurement of Vapor
                Pressure in a Broad Temperature Interval (Membrannyy
                nul'manometr dlya izmereniya davleniya parov v shirokom
                intervale temperatur)

PERIODICAL: Zavodskaya Laboratoriya, 1959, Vol 25, Nr 6, pp 750-751 (USSR)

ABSTRACT: Several years ago a production technique was worked out of
                membranes for zero pressure gauges without the shortcomings
                of the pressure gauges according to reference 2 (Ref 1). As
                the membrane chamber is also in the present case not quite
                small enough, a device with smaller dimensions and a flat
                membrane was constructed. The pressure gauge may be made of
                molybdenum- or pyrex glass as well as of quartz (figure 1,
                scheme of the pressure gauge). The glass membrane is made
                from a glass ball which is blown and then flattened (Fig 2).
                A rodlet is melted on to the surface the shift of which in
                connection with a motion of the membrane indicates a change
                in pressure on an opposed needle. The sensitivity of
                measurements depends on the quality of the membrane, the
Card 1/2   thickness of the rodlet and the deviation of the top of the

28(5)

SOV/32-25-9-27/53

AUTHORS: Novikov, G. I., Suvorov, A. V., Bayev, A. K.

TITLE: Method of Determining the Pressure of the Saturated Vapor
             of Difficultly Volatile Substances

ABSTRACT: A method was developed by which the sample is vaporized in
             an inert gas in a closed vessel, the inert gas acting as
             elastic medium which transfers the vapor pressure to a pres-
             sure gauge outside the high-temperature range. From the scheme
             of the gauge (Fig 2) it may be seen that the substance to be
             investigated evaporates in a cylindrical quartz vessel which
             is housed in a furnace and is connected to a diaphragm zero-
             pressure gauge by means of a tube. The latter is contained
             in a thermostat and transmits the pressure to the pressure
             gauge which permits measurements with an accuracy of $\pm$ 0.5 torr.
             From the measurement results obtained on the apparatus describ-
             ed the pressure of the saturated vapor of KCl was computed,
             and a curve of the dependence of the vapor pressure on tem-
             perature was plotted (Fig 3). Comparison with the correspond-
             ing values in Stell's table shows good agreement of the data.
             There are 3 figures.

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SOV/32-25-9-27/53

Method of Determining the Pressure of the Saturated Vapor of Difficultly
Volatile Substances

ASSOCIATION: Leningradskiy gosudarstvennyy universitet im. A. A. Zhdanova
(Leningrad State University imeni A. A. Zhdanov)

Card 2/2

NOVIKOV, G.I.; MAKARENYA, A.A.; RYABOV, A.N.; SUVOROV, A.V.

Improved circulation method of determining the dissociation pressure. Izv. vys. ucheb. zav; khim. i khim. tekh. 3 no. 5:952-958 '60.   (MIRA 13:12)

1. Leningradskiy gosudarstvennyy universitet. Kafedra obshchey i neorganicheskoy khimii.
                              (Gases--Analysis)

Suvorov A V.

S/078/60/005/008/002/018
B004/B052

AUTHORS: Shchukarev, S. A., Novikov, G. I., Vasil'kova, I. V.,
Suvorov, A. V., Andreyeva, N. V., Sharupin, B. N.,
Bayev, A. K.

TITLE: The Thermodynamic Properties of Chlorides and Oxychlorides
of Tungsten and Molybdenum

PERIODICAL: Zhurnal neorganicheskoy khimii, 1960, Vol. 5, No. 8,
pp. 1650-1654

TEXT: By applying various methods, the authors wanted to check the
formation heats, formation entropies, and formation enthalpies in the case
of Mo- and W chlorides, published in western papers (Refs. 1, 2). They
investigated: WCl_6, $MoCl_5$, $WOCl_4$, $MoCl_4$, WO_2Cl_2 (obtained by a successive
chlorination of WO_3 and MoO_3 by means of CCl_4; MoO_2Cl_2 (obtained by the
reaction between MoO_2 and Cl_2); $MoCl_3$, WCl_4, WCl_5 (by the reduction of
$MoCl_5$ and WCl_6 by means of H_2); and $MoCl_2$, WCl_2 (obtained by dispropor-

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(4)

The Thermodynamic Properties of Chlorides   S/078/60/005/008/002/018
and Oxychlorides of Tungsten and Molybdenum   B004/B052

tion of $MoCl_3$ and WCl_4, and $MoOCl_4$). Two calorimetric methods were applied:
1) Comparison of the heat of solution of the investigated substance to the
heat of solution of a substance whose heat of formation is known (Table 1).
2) Combustion in oxygen (Table 2). Furthermore, the vaporization, depoly-
merization, dissociation, and disproportionation processes taking place in
a state of equilibrium, were spectrophotometrically and tensimetrically
investigated (Tables 3, 4). The enthalpies of formation, and partly also
the standard entropies of formation were calculated from the experimental
data. In Tables 5 (Mo compounds) and 6 (W compounds) they are compared
with the data given in Ref. 2 which were adopted almost unchanged by the
US National Bureau of Standards (Ref. 9). The values determined by the
authors are 1.4 - 1.7 times as high. Therefore, the dependence of the
free energy of formation of temperature is different altogether. This is
graphically represented in Fig. 1 (comparison of determined ΔH^o and ΔF^o
for tungsten compounds, with the data of the National Bureau of Standards),
and Fig. 2 (comparison of the ΔH_{form} of Cr, Mo, and W chlorides, with

the data of the National Bureau of Standards). There are 2 figures,
6 tables, and 9 references: 6 Soviet, 2 US, and 1 Dutch.

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The Thermodynamic Properties of Chlorides   S/078/60/005/008/002/018
and Oxychlorides of Tungsten and Molybdenum   B004/B052

ASSOCIATION: Leningradskiy gosudarstvennyy universitet Khimicheskiy
                fakul'tet
                (Leningrad State University Department of Chemistry)

SUBMITTED: May 6, 1959

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SUVOROV, A. V.

Cand Chem Sci - (diss) "Thermodynamics study of oxychlorides of molybdenum and tungsten." Leningrad, 1961. 16 pp; (Academy of Sciences USSR, Inst of Chemistry of Silicates); 150 copies; price not given; list of author's works at end of text (10 entries); (KL, 7-61 sup, 223)

LORENTSO, D.N.; OKUNEV, I.V., inzh., red.; ZABAYKIN, A.Ya., inzh., red.; KOZLOV, A.G., nauchnyy red.; MARES'YEV, M.I., red.; SUVOROV, A.V., red.; YAMOV, A.F., red.; DUGINA, N.A., tekhn. red.

[Ural Railroad Car Plant] Ural'skii Vagonostroitel'nyi Zavod. Moskva, Gos. nauchno-tekhn.izd-vo mashinostroit. lit-ry, 1961. 162 p.   (MIRA 15:2)

1. Ural'skiy vagonostroitel'nyy zavod (for Lorentso). (Nizhniy Tagil—Railroads—Cars—Construction)

S/054/61/000/001/007/008
B117/B203

AUTHORS: Shchukarev, S. A., Suvorov, A. V.

TITLE: Thermodynamic study of some chlorine derivatives of molybdenum and tungsten

PERIODICAL: Vestnik Leningradskogo universiteta. Seriya fiziki i khimii, no. 1, 1961. 87-99

TEXT: The authors give results of thermodynamic studies of compounds of two isotope groups: $MoCl_5 - MoOCl_4 - MoO_2Cl_2 - MoO_3$ and $WCl_6 - WOCl_4 - WO_2Cl_2 - WO_3$. They used their membrane- and opticotensimetric methods (Ref. 23: G. I. Novikov, A. V. Suvorov, "Zav. lab." no. 6, 750, 1959; Ref. 24: S. A. Shchukarev, G. I. Novikov, A. V. Suvorov, ZhNKh. 1, 2433, 1956). The two apparatus used were improved. For instance, temperature was measured with the aid of a thermocolumn consisting of three thermocouples with an accuracy of $\pm 0.5\%$. By means of an ЭПВ-01 (EPV-01) electron potentiometer it was possible to keep the temperature constant for a long period (1-20 hr) with the same accuracy. Pressure

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Thermodynamic study of some chlorine...

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was measured in the range of 1-800 mm Hg with an MБП (MBP) mercury mano-
meter with an accuracy of $\pm$0.1 mm Hg, and in the range of 800-1400 mm Hg
with a U-shaped mercury manometer with an accuracy of $\pm$1 mm Hg. With the
use of an ФЭУ-19-М (FEU-19-M) electron photomultiplier together with a volt-
age divider it was possible to extend considerably the range of exactly
measureable optical densities. With the use of plane-parallel, all-soldered
optical cuvettes, the optical density was measured with the same accuracy as
the vapor pressure (about 0.5-1%). The pressure of saturated and unsaturated
$MoCl_5$ vapor was studied. Two series of measurements were made at a chlorine
pressure of about 300 and 400 mm Hg in a temperature range of 80°-300°C.
The data averaged by the method of least squares correspond to the equations:

		ΔH, kcal/mole	ΔS energy units
sublimation $[MoCl_5]_{solid}$	$\log P_{atm}= 9.150-4750/T$	21.7 ± 0.5	43.5 ± 0.5
evaporation $MoCl_5$ liqu	$\log P_{atm}= 5.536-3036/T$	13.9 ± 0.5	25.3 ± 0.5

By simultaneous solution of these equations, the melting point 201°C and
the boiling point 276.5°C are obtained. The values determined from the

dissociation equation $(MoCl_5)_{gas} = (MoCl_4)_{gas} + \frac{1}{2}(Cl_2)_{gas}$ for the equi-

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Thermodynamic study of some chlorine...

librium constant K_p correspond to the equation $\log K_p = 3.201 - 2779/T$; $\Delta H = 12.8 \pm 0.5$ kcal/mole; $\Delta S = 14.8 \pm 0.5$ energy units. The data found for the evaporation process of liquid $MoOCl_4$ correspond to the equation: $\log P_{atm} = 4.783 - 2552/T$; $\Delta H = 11.7 \pm 0.5$ kcal/mole; $\Delta S = 21.9 \pm 0.5$ energy units. This gives a boiling point of $250.5^\circ C$. The data determined for the dissociation of $MoOCl_4$ according to the scheme $(MoOCl_4) = (MoOCl_3) + \frac{1}{2}(Cl_2)$ from two series of measurements at an initial chlorine pressure of 170 and 430 mm Hg correspond to the equation: $\log K_p = 3.152 - 2498/T$; $\Delta H = 11.5 \pm 1$ kcal/mole; $\Delta S = 14.5 \pm 1$ energy unit. To investigate the thermodynamic characteristics of MoO_2Cl_2, the authors studied its process of formation from MoO_3 and chlorine according to the scheme $[MoO_3] + (Cl_2) = (MoO_2Cl_2 + \frac{1}{2}(O_2)$. Experiments showed that MoO_3 started reacting with chlorine at temperature above $500^\circ C$. The results obtained correspond to the equation: $\log K_p = 3.112 - 2865/T$; $\Delta H = 13 \pm 1$ kcal/mole; $\Delta S = 14 \pm 1$ energy units. The pressure of saturated WCl_6 vapor was studied

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Thermodynamic study of some chlorine...

at pressures of up to 900 mm Hg. The data obtained corresponded to the following equations: (1) Sublimation α-WCl_6: $\log P_{atm} = 7.480 - 4400/T$; $\Delta H = 20.1 \pm 0.3$ kcal/mole; $\Delta S = 34.3 \pm 0.5$ energy units; (2) sublimation β-WCl_6: $\log P_{atm} = 5.983 - 3645/T$; $\Delta H = 16.7 \pm 0.3$ kcal/mole; $\Delta S = 27.5 \pm 0.5$ energy units; (3) evaporation WCl_6: $\log P_{atm} = 5.222 - 3216/T$; $\Delta H = 14.7 \pm 0.5$ kcal/mole; $\Delta S = 24.0 \pm 0.5$ energy units. By simultaneous solution of these equations the temperatures of phase transformations are obtained: $T_{\alpha-\beta} = 231^{\circ}C$, $T_{melt} = 291^{\circ}C$. $T_{boil} = 343^{\circ}C$ is determined by solving Eq. (3) with $P = 1$. In the range of unsaturated vapor, the dissociation of WCl_6 occurs in two stages at the same time. The data found correspond to the equations: $(WCl_6) = (WCl_5) + \frac{1}{2}(Cl_2)$ $\log K_p = 6.729 - 5280/T$; $\Delta H = 24.2 \pm 0.5$ kcal/mole; $\Delta S = 30.8 \pm 0.5$ energy units; $(WCl_6) = (WCl_4) + (Cl_2)$ $\log K_p = 11.200 - 9333/T$; $\Delta H = 43 \pm 1$ kcal/mole; $\Delta S = 51 \pm 0.5$ energy units. This shows that the dissociation of WCl_6 in the first stage is more intensive than in the

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second stage. The pressure of saturated $WOCl_4$ vapor was measured up to 1340 mm Hg. The data obtained correspond to the equations: Sublimation $WOCl_4$: $\log P_{atm} = 9.743 - 4789/T$; $\Delta H = 21.7 \pm 0.5$ kcal/mole;

$\Delta S = 44.2 \pm 0.5$ energy units; evaporation $WOCl_4$: $\log P_{atm} = 4.564 - 2250/T$;

$\Delta H = 11 \pm 1$ kcal/mole; $\Delta S = 22 \pm 1$ energy units: hence, the melting point of 211°C and the boiling point of 227°C are obtained. For the dispropor-tionation of $WOCl_4$ according to the scheme $2(WOCl_4) = (WO_2Cl_2) + (WCl_6)$,

the following thermodynamic characteristics were determined in first approximation: $\log K_p = 1.41 - 2400/T$; $\Delta H = 11 \pm 1$ kcal/mole;

$\Delta S = 6 \pm 1$ energy units. In the system WO_2Cl_2, the simultaneous course

of three independent processes is assumed: (I) $[WO_2Cl_2] = (WO_2Cl_2)$;

(II) $2[WO_2Cl_2] = (WOCl_4) + [WO_3]$, and (III) $3[WO_2Cl_2] = (WCl_6) + 2[WO_3]$.

The partial pressures obtained and the respective equilibrium constants correspond to the equations (pressure in atm): (I) $\log P_{WO_2Cl_2} = 6.666 - 5043/T$;

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$\Delta H = 23 \pm 1$ kcal/mole; $\Delta S = 31 \pm 1$ energy units; (II) $\log P_{WOCl_4} = 11.547 - 7471/T$;

$\Delta H = 36 \pm 1$ kcal/mole; $\Delta S = 56 \pm 1$ energy units; (III) $\log P_{WCl_6} = 18.455 - 12648/T$;

$\Delta H = 56 \pm 1$ kcal/mole; $\Delta S = 82 \pm 1$ energy units. The simultaneous solution of these equations shows that WO_2Cl_2 prevails in vapors only below 224°C. At higher temperatures, $WOCl_4$ prevails. At 372°C, the pressure of WCl_6 vapor equals the pressure of WO_2Cl_2 vapor. At temperatures above $400^\circ - 450^\circ$C, the dissociation processes must obviously not be neglected. The composition of vapor above WO_2Cl_2 becomes even more complicated.

A. V. Tarasov assisted in the investigations of $WOCl_4$ and WO_2Cl_2. D. N. Tarasenkov and A. V. Komandin are mentioned. There are 5 tables and 26 references: 15 Soviet-bloc and 11 non-Soviet-bloc.

Card 6/6

SHCHUKAREV, S.A.; SUVOROV, A.V.

Thermodynamic study of chloro derivatives of molybdenum and tungsten.
Zhur.neorg.khim. 6 no.6:1488-1489 Je '61.   (MIRA 14:11)
(Molybdenum chloride) (Tungsten chloride)

KURBANOV, A.R.; SUVOROV, A.V.; SHCHUKAREV, S.A.; NOVIKOV, G.I.

Thermodynamics of tantalum chlorides. Zhur. neorg. khim. 9
no.3:520-525 Mr '64.

(MIRA 17:3)

SUVOROV, A.V.; DOBROTIN, R.B.; GADZHIYEV, S.M.

Equilibrium of dissociation in sulfuric acid vapors. Zhur.
neorg. khim. 10 no.6:1307-1311 Je '65.

(MIRA 18:6)

SUVOROV, B.; VOLKOV, V., inzh.

Amu Darya, the river of friendship. Mor. flot. 24 no.8:30 Ag '64.

1. Zamestitel' nachal'nika Sredneaziatskogo parokhodstva (for Suvorov).
2. Sredneaziatskoye parokhodstvo (for Volkov).

(MIRA 18:9)

SUVOROV, B.; VOLKOV, V., inzh.

Make wide use of economic analysis. Mor. flot 23 no.10:17 O '63.
(MIRA 16:10)
1. Predsedatel' ekonomicheskogo soveta, zamestitel' nauchal'nika Upravleniya Sredneaziatskogo parokhodstva po ekspluatatsii (for Suvorov). 2. Chlen ekonomicheskogo soveta Upravleniya Sredneaziatskogo parokhodstva po ekspluatatsii (for Volkov).
(Merchant marine)